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Assessment of General Medical Consultations in the Healthcare Service of a Multinational Banking Company

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Clinical significance:

This study identified clear patterns in the use of workplace medical consultations. The most frequently attended specialties were Otorhinolaryngology and Traumatology, while the leading diagnostic categories included upper respiratory tract infections and acute musculoskeletal pain. These insights may guide resource planning and support policies that promote timely, on-site healthcare access.

ABSTRACT

Objectives

Identify the most frequent consultations over two years in the Occupational Health Service of a Spanish multinational bank in Madrid.

Material and methods

Cross-sectional study; consultations classified by ICD, sex, and age. Associations with sex, age group, month, year, and weekday were tested using Pearson's χ^2; age across categories with Kruskal–Wallis; logistic regression estimated effects of sex and age. The dataset lacked an indicator to distinguish occupational from non-occupational causes; all visits were analyzed.

Results

From June 2022 to June 2024, 6,448 visits were recorded. Sex was balanced (48.5% men, 51.5% women); 58.6% aged 35–50. Otolaryngology (32.4%) and Traumatology (12.9%) predominated; upper respiratory infections led (24.6%). Significant associations appeared with sociodemographic ($p<2.2e-16$). Consultations varied by month (χ^2, $p<0.05$) and by weekday (χ^2, $p=0.045$).

Conclusions

Results support resource planning and highlight the strategic role of occupational health services.

Key words

Occupational health, workplace medicine, respiratory infections, musculoskeletal disorders, medical consultations.

Learning Outcomes

- Identify the most frequent reasons for medical consultation in an Occupational Health Service of a multinational banking company over a two-year period.
- Recognize the associations between diagnostic categories and sociodemographic variables such as sex, age, month, year, and weekday.
- Apply the study's findings to improve healthcare resource planning and strategic decision-making in occupational health services.

INTRODUCTION

Occupational health services have internationally recognized core functions, including advising employers and workers; surveillance of the working environment and workers' health; prevention and early detection of work-related problems; health promotion; and facilitating access to appropriate clinical care when needed (1,2). From a global health perspective—"healthy people in healthy environments"—the workplace is a strategic setting for health promotion and early detection. In line with these functions, the Prevention Service of the financial institution where this study was conducted provides on-site general medical consultations at its two central offices without a prior appointment. In Spain, the provision of such services within workplace prevention units is framed by national regulation (3).

Among the five areas of influence in Occupational Medicine, healthcare provision constitutes a fundamental pillar(3). Therefore, the Prevention Service of the financial institution where this study is conducted offers general medical consultations at its two central offices without requiring a prior appointment.

The 2020 European Health Survey in Spain(4) provides an overview of the use of healthcare services among the general population. According to this report, 21% of men and 29.2% of women attended primary care consultations in the past four weeks, with acute respiratory infections (ARIs) being the most frequent reason for consultation.

Prevention Services represent a key tool for the early detection of both occupational and non-occupational diseases, as well as for the early identification of modifiable risk factors (e.g., smoking, obesity)(5–9). In countries like Finland and Germany, prevention services offer on-site medical consultations for both work-related and non-work-related conditions, and their use is high among employees(5,10,11).

To date, no published studies are known to have specifically analyzed the profile and characteristics of medical consultations conducted within a workplace prevention service. This lack of evidence represents a significant gap in knowledge, particularly considering the potential of such services to facilitate healthcare access. In this context, we carried out a descriptive cross-

sectional study over a two-year period (2022–2024) in a multinational company located in the Madrid region (Spain). The aim is to characterize the profile of the medical consultations attended by the Prevention Service, as well as to analyze their potential association with workers' age and sex. Consultations included both occupational and non-occupational reasons for visit, which could not be reliably distinguished.

Unlike studies that explicitly separate occupational from non-occupational encounters, our setting did not capture the occupational nature of consultations in a structured way. Therefore, the aim of this study is to characterize general on-site healthcare demand in the workplace medical service as input for operational planning and preventive measures. The specific evaluation of occupational injuries and illnesses is deferred to future longitudinal studies.

MATERIALS AND METHODS

Study design

This is a descriptive observational cross-sectional study involving employees of a multinational company located in the Community of Madrid region who were attended in medical consultations between 2022 and 2024.

All reasons for consultations managed by the occupational health service over the two-year period (from June 1, 2022, to June 1, 2024) were identified based on the diagnostic coding used by the occupational health software (MEDTRA©). Consultations related to sick leave or occupational accidents were excluded. These events were few and were predominantly *in itinere* (home–work or work–home) and traumatic in nature. In Spain, *in itinere* events are legally recognized as work accidents under the consolidated General Social Security Law (12).

Population

The working population included employees from various occupational sectors within the company, such as administrative staff, customer service personnel, technicians, and IT staff, all subject to the health surveillance protocol for Visual Display Units (VDU)(13). Data were

extracted from the MEDTRA© system. These data were cleaned using Microsoft Excel, where medical consultations were classified and duplicate records removed.

The study population consisted of employees based in Spain. During the evaluation period (June 2022 to June 2024), the company had 33,190 employees: 19,120 (57.6%) in the Community of Madrid region and 14,070 (42.3%) across other regions.

As shown in **Figure 1**, of those in the Madrid region, 15,920 were assigned to central services. The study focused on this subpopulation, from which a total of 6,448 medical consultations were recorded during the study period. Employees from the office branch network (n = 3,200) were excluded from the analysis.

Inclusion criteria were: (1) employees assigned to central services during the study period (June 2022 to June 2024), and (2) having at least one recorded medical consultation within that time frame. **Exclusion criteria** were: (1) employees in the office branch network (n = 3,200), due to lack of accessible clinical data; (2) employees located in other regions other than the Madrid region; and (3) those without any recorded medical consultation during the study period. Reason for visit (occupational vs. non-occupational) was not available in a structured field and could not be determined retrospectively.

Variables

The main variables analyzed were sex, as the primary independent variable, and the reason for medical consultation. The primary outcome was the reason for consultation, defined as the diagnostic category recorded in the MEDTRA© system after clinical evaluation. These categories were coded according to the classification used in the medical service and grouped into areas such as Otolaryngology, Traumatology, Dermatology, Ophthalmology, Pulmonology, among others coded according to the International Classification ICD-9 (14).

Additionally, a more specific diagnostic sub-classification also based on the ICD-9 (14) was used to detail consultation reasons, including upper respiratory tract infections, acute musculoskeletal pain, inflammatory-infectious ocular processes, behavioral disorders, and other clinical

conditions. These subcategories were used for descriptive analysis.

Statistical analysis

Statistical analysis was performed using R, a free, open-source programming language used for statistical computing and data visualization. Descriptive statistics were employed to summarize sociodemographic characteristics and reasons for consultation. Pearson's chi-squared test (χ^2) was applied to assess associations between categorical variables, such as sex, month, or day of the week, and the reason for consultation. The Kruskal-Wallis test was used to compare age across diagnostic categories. Additionally, logistic regression models were constructed to explore the multivariate relationship between sociodemographic variables (sex and age) and the probability of attending specific specialties. A p-value < 0.05 was considered the limit for statistical significance. All analyses were conducted in accordance with the STROBE (Strengthening the Reporting of Observational Studies in Epidemiology) guidelines (Supplemental Digital Content, http://links.lww.com/JOM/C172).(15) Analyses were conducted on the full set of consultations without stratification by occupational versus non-occupational reason.

Ethics approval

The study was conducted in accordance with the principles of the Declaration of Helsinki. It was approved by the Research Ethics Committee of Universidad Internacional de La Rioja (Ref. PI0148/2024) on January 8, 2025**.**

RESULTS

A total of 6,448 consultations (visit-level records) were recorded between June 2022 and June 2024. Classification as occupational versus non-occupational and claim status were not available from the clinical record. Work accidents were excluded. Of all consultations, 48.5% were made by men (n = 3,130) and 51.5% by women (n = 3,328). Age ranged from 21 to 65 years. Most consultations occurred in the 35–50 age group (n = 3,780; 58.6%), followed by those >50 years (22.6%) and <35 years (18.8%). All counts refer to consultations and may include visits by the

same individual.

The most frequent diagnostic category by medical specialty (**Table 1**) was Otolaryngology, accounting for 32.2% of all consultations (n = 2,088). This was followed by Traumatology (12.9%; n = 832), administrative consultations (8.3%; n = 535), Ophthalmology (6.5%; n = 419), and Pneumology (5.8%). Administrative consultations refer to visits to the medical service that are not prompted by an acute medical complaint, but rather for administrative or procedural purposes, such as issuing repeat prescriptions, ordering laboratory tests, reviewing test results, processing medical certificates, or managing other non-clinical formalities. Altogether, these five categories accounted for over 65% of all clinical visits.

At the diagnostic subclassification level (Table 2), upper respiratory tract infections were the most prevalent reason for consultation (n = 1,588; 24.6%), followed by acute musculoskeletal soft tissue pain (n = 670; 10.4%), inflammatory-infectious ocular conditions (n = 279; 4.3%), and lower respiratory tract infections (n = 204; 4.9%).

Table 2 shows how upper respiratory tract infections (24.6%) were the most prevalent reason for consultation, followed by acute soft tissue musculoskeletal pain (10.4%), inflammatory-infectious ocular processes (4.3%) and lower respiratory tract infections. Table 2 reflects clinical diversity, including less frequent diagnoses such as hypertensive crises, dental pain, or syncope.

Table 3 shows the consultation reasons with the greatest differences between men (M) and women (F). This table presents the specialties with the greatest differences by sex, highlighting higher consultation rates among men in Traumatology, Endocrinology, and General Emergencies, and among women in Otorhinolaryngology, Genitourinary, and Hematology. Differences are expressed in percentage points.

Statistical analysis revealed a significant association between sex and reason for consultation (Pearson's χ^2 test, $p < 2.2e\text{-}16$). Men had a higher proportion of visits in categories such as (in order of greatest to smallest difference): Traumatology (14.0% vs. 11.9%), Endocrinology (5.1% vs. 2.9%), General Emergencies (5.4% vs. 3.9%), Cardiology, and administrative visits. In

contrast, women consulted more frequently for (in: Otolaryngology (33.8% vs. 30.9%), Urology (6.0% vs. 2.8%), Gynecology (2.4% vs. 0.1%), Hematology (3% vs 0.4%), and Neuropsychiatry (4.8% vs 3.7%).

Age also showed a significant relationship with the reason for consultation (Kruskal–Wallis test, $p < 2.2e-16$). The diagnostic categories with the highest median ages were Cardiology and Oncology (49 years), Dentistry and Rheumatology (47 years), administrative visit and Endocrinology (46 years). At the opposite end, Gynecology had the lowest median age (35 years), followed by Hematology (42 years).

Table 4 shows monthly variations in the number of consultations for each specialty, including the overall monthly average. Specialties such as Dermatology and ORL showed seasonal patterns, with peaks in summer and winter, respectively. Significant monthly variation was confirmed ($p = 2.5e-15$).

A significant variation was also found in the monthly distribution of consultations ($p = 2.5e-15$, chi-squared test (χ^2). The months with the highest number of cases were July (n = 766), June (n = 713), and November (n = 634). Some categories, such as Dermatology, showed peaks in summer, while Otolaryngology saw increases in winter months.

Finally, analysis by day of the week showed a higher number of consultations on Mondays (n = 1,625) and Tuesdays (n = 1,443), with a p-value near the threshold of statistical significance ($p \approx 0.045$).

DISCUSSION

Key findings: This cross-sectional study provides an overview of the medical consultation profile in an occupational health service. The most frequent specialties were Otolaryngology (ENT), Traumatology, and administrative visits, and upper respiratory tract infections were the leading diagnostic category. Consultations showed seasonal peaks (summer and winter) and were more

frequent early in the week. Reasons for visit varied by sex and age, with patterns consistent with a working-age population.

Comparison with prior literature: Our finding that upper respiratory tract infections dominate presentations aligns with reports on common primary care reasons for consultation in Spain (16). Sex-specific patterns (e.g., higher Traumatology in men; higher ENT and Genitourinary in women) are consistent with previous studies (17,18). The age gradient observed for specialties such as Cardiology and Oncology mirrors prior evidence associating these consultations with older age groups (19–21). Regarding seasonality, dermatologic and ENT/respiratory variability reported supports the observed summer increases for selected diagnoses and the predominance of ENT visits in colder months (22–25).

Interpretation: The association between sex and reason for consultation may reflect differences in perceived morbidity and care-seeking behavior influenced by biological, occupational, and sociocultural factors (8,26). The concentration of visits among mid-career workers may help explain the predominance of acute, self-limited conditions over chronic-disease follow-up. Same-day access during working hours may reduce barriers to care and shape demand patterns within the workplace setting (27).

Practical/occupational implications. Seasonal ENT/respiratory peaks could support implementing evidence-based preventive measures that could include: actively offering and promoting seasonal vaccination campaigns (e.g., influenza and COVID-19), which can increase coverage and reduce morbidity and absenteeism (28,29); intensifying hand-hygiene promotion, a low-cost a high-yield action associated with 11–14% relative reductions in acute respiratory infections in community and workplace trials (30); and issuing brief, threshold-triggered communications (e.g., when weekly respiratory consultations exceed a predefined level) coupled with rapid triage/tele-advice (31,32).

Managing low-complexity episodes on site may relieve community primary care and shorten time-to-treatment. Evidence suggests that on site medical services can reduce burden on the broader health system (primarily by lowering utilization of off-site outpatient and hospital

services and by improving access to primary and preventive care), as observational cohort studies report: employees who use workplace clinics have fewer external visits and lower total medical spending than non-users or occasional users (33,34).

Regarding incidence or prevalence of certain diseases, the evidence is more mixed. In selected settings, reductions in diagnoses such as diabetes and improvements in cardiovascular risk profiles have been reported, but effects are generally small, context-dependent, and require longer follow-up to assess their impact on disease prevalence (34,35).

Limitations: This study describes consultations among employees who attended the service and should not be used to infer disease prevalence across the entire workforce. The cross-sectional design precludes causal inference. Selection and access effects (younger workforce; easier same-day access) may have influenced observed patterns. Perceptions regarding confidentiality or the sensitivity of some issues (e.g., mental, sexual and reproductive health) could have deterred use, potentially underrepresenting certain conditions. Finally, we could not distinguish occupational from non-occupational reasons for visit because a structured indicator was not captured in the electronic record; consequently, our findings describe the overall activity of the Prevention Service rather than cause-specific patterns. Because a stable patient identifier was unavailable, we could not estimate the number of unique patients or the frequency of repeat visits; results therefore reflect consultation-level activity.

Generalizability: Despite its descriptive nature, these findings may be informative for organizations with similar workforce profiles and access models. Although we did not directly measure sick leave, accessible in-situ services may facilitate timelier care and could help reduce indirect costs (36–38). The results can support policy and program design in occupational health, with potential impact on health promotion, disease prevention (9) and productivity.

Future research: Future work should clarify causal pathways, determine whether the pathology has an occupational/work-related origin, and quantify program effects on outcomes such as absenteeism, external healthcare utilization, and disease prevalence.

Conclusions: Understanding the health problems that most affect our workforce enables us to improve employee well-being and strengthens the overall health of the organization. Combining occupational prevention, general health promotion, and streamlined care pathways we can achieve to have "*healthy people in healthy organizations"*. This integrated approach enhances system sustainability by absorbing low-complexity demand and alleviating pressure on primary care. Accordingly, we propose a model that reinforces hazard identification and risk control, incorporates prevention and management of common conditions, and improves the accessibility and efficiency of on medical services.

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Figure Legends

Figure 1. A flow diagram depicting the selection of the study population and the total number of medical consultations attended between June 2022 and June 2024 within the occupational health service of a Spanish multinational banking company headquartered in Madrid.

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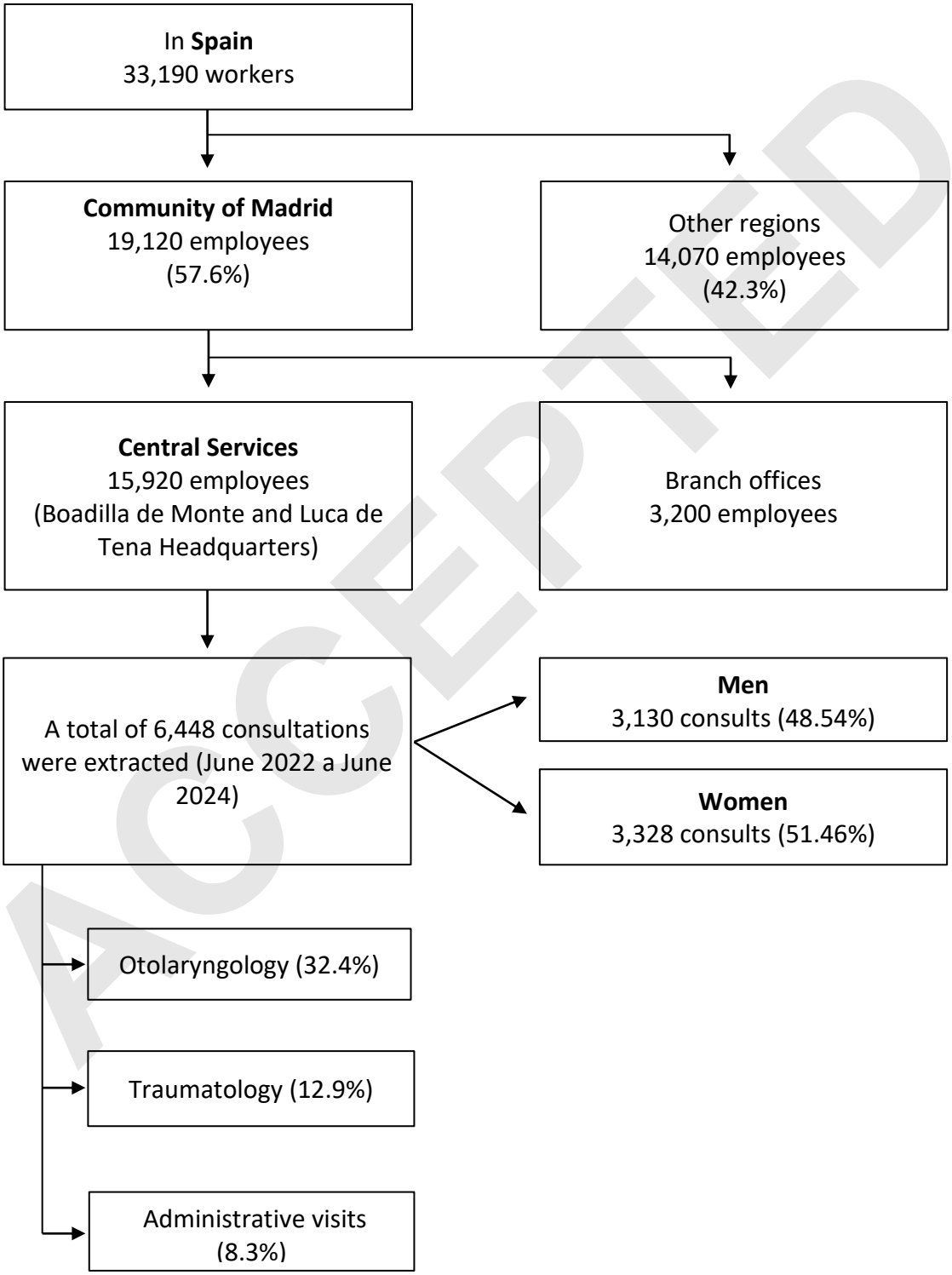

Table 1. Most frequent medical specialties attended in the occupational health service (n = 6,448), in absolute numbers (n) and percentage (%) of total consultations registered between June 2022 and June 2024.

CLASIFICATION	Freq. (n)	Freq. (%)
OTOLARINGOLOGY	2088	32.2
ORTHOPEDICS/TRAUMATOLOGY	832	12.9
ADMINISTRATIVE VISITS	535	8.3
OPHTHALMOLOGY	419	6.5
PNEUMOLOGY	372	5.8
DERMATOLOGY	356	5.5
EMERGENCY MEDICINE	298	4.6
UROLOGY	287	4.5
NEUROLOGY AND PSYCHIATRY	276	4.3
ENDOCRINOLOGY	254	3.9
DIGESTIVE	202	3.1
CARDIOLOGY	152	2.4
HEMATOLOGY	110	1.7
GYNECOLOGY	82	1.3
EXTERNAL AGENTS	75	1.2
DENTISTRY	61	0.9
RHEUMATOLOGY	35	0.5

Table 2. Most common diagnostic categories by sub-specialty (n = 6,448), in absolute numbers (n) and percentage (%).

SUBCLASIFICACION	Freq. (n)	Freq. (%)
UPPER RESPIRATORY TRACT INFECTION	1588	38.5
ACUTE MUSCULOSKELETAL PAIN (SOFT TISSUE)	670	16.2
INFLAMMATORY-INFECTIOUS OCULAR CONDITIONS	279	6.8
LOWER RESPIRATORY TRACT INFECTION	204	4.9
BEHAVIORAL DISORDERS	163	3.9
VERTIGO/DIZZINESS	161	3.9
TOBACCO-RELATED CONSULTATION	158	3.8
SOFT TISSUE INFECTION	125	3.0
HYPERTENSIVE CRISIS	91	2.2
ACUTE CHEST PAIN	76	1.8
ACUTE HEADACHE	74	1.8
ALLERGY	69	1.7
BITES/STINGS	67	1.6
SYNCOPE	65	1.6
DENTAL PAIN AND ORAL CONDITIONS	63	1.5
DEHYDRATION, DIARRHEA, VOMITING	54	1.3
WOUNDS/BLEEDING	47	1.1
ARRHYTHMIAS	39	0.9
HERPES ZOSTER	32	0.8
ABDOMINAL PAIN	21	0.5
ACUTE SOFT TISSUE PAIN	16	0.4
FOREIGN BODY	15	0.4
DYSPNEA	10	0.2
SEIZURES	8	0.2
EPISTAXIS	6	0.1
BURN	6	0.1
TRAUMATIC OPHTHALMOLOGIC EMERGENCIES	6	0.1
HYPOGLYCEMIA	4	0.1
ANAPHYLACTIC REACTION	4	0.1
ACUTE CORONARY SYNDROME	4	0.1
POLYTRAUMA PATIENT	2	0.0
SUDDEN VISUAL DISTURBANCES	1	0.0
ACUTE ABDOMINAL PAIN	1	0.0

Table 3. Medical specialties with the largest sex-based differences in consultation frequency (%), comparing men (M) and women (F).

MEN:

Classification	Men (%)	Women (%)	Difference
ADMINISTRATIVE VISITS	9,8	6,9	**2,9**
ENDOCRINOLOGY	5,1	2,9	**2,2**
ORTHOPEDICS	14	11,9	**2,1**
CARDIOLOGY	3,2	1,5	**1,7**
URGENCIES	5,4	3,9	**1,5**

WOMEN:

Classification	Women (%)	Men (%)	Difference
GENITOURINARY	6	2,8	**3,2**
OTHORINOLARINGOLOGY	33,8	30,9	**2,9**
HEMATOLOGY	3	0,4	**2,6**
GINECOLOGIY	2,4	0,1	**2,3**
NEUROLOGIA AND PSIQUIATRY	4,8	3,7	**1,1**

Table 4. Monthly distribution of consultations by medical specialty, from June 2022 to June 2024.

	January	February	March	April	May	June	July	August	September	October	November	December	Mean
EXTERNAL AGENTS	0,2	0,2	0,2	0,4	0,6	1,8	4,3	2,8	1,1	0,8	0,2	0,7	**1,16**
CARDIOLOGY	1,7	2,6	2,4	4,1	3,1	2	2,1	2,8	1,7	1,8	2,4	2	**2,36**
ADMINISTRATIVE	6,2	9,9	7,1	6	8	7,4	10,6	8,5	7,5	8,8	12,6	4,7	**8,3**
DERMATOLOGY	4,7	5,1	5,2	6	4,2	5,3	7	6,7	5,3	4,7	6	5,8	**5,52**
GASTROENTEROLOGY	2,6	3,7	3,1	4,3	3,4	2,9	2,7	3,5	4,1	2,1	2,4	3,4	**3,13**
ENDOCRINOLOGY	2,8	3,6	3,4	3,9	4,2	2,9	3,3	4,9	4,9	5,1	4,4	5,2	**3,94**
GENITOURINARY	2,6	4,1	3,6	4,8	3,4	6,7	5,7	3,9	6	4,5	3	3,6	**4,45**
GYNECOLOGY	1,5	0,9	1,2	3,1	1,3	1,5	1,4	1,1	0,9	0,6	0,8	0,7	**1,27**
HEMATOLOGY	3	1,7	0,9	1,7	0,6	1,3	2,3	0,4	2,6	1	2,7	1,8	**1,71**
PULMONOLOGY	6,8	6,4	7,2	5,4	5,3	5,5	3,8	4,6	5,5	6	5,2	8,3	**5,77**
NEUROLOGY/PSYCHIATRY	4,5	4,9	3,8	4,8	4,2	5,2	4,2	2,8	3,8	5,3	3,2	4	**4,28**
DENTISTRY	1,1	0,6	0,9	1,4	1	1,1	1,2	1,1	1,1	1,4	0,6	0	**0,95**
OPHTHALMOLOGY	8,1	7,5	7,6	4,4	6,7	6,3	8	7	5,8	6,8	5	4,3	**6,5**
ONCOLOGY	0	0,2	0,7	0,4	0,2	0,1	0,1	0	0,4	0,2	0	0	**0,2**
OTOLARYNGOLOGY	38	30	33,6	27,3	33,8	30,9	25,2	32,4	29,2	34,5	36	42,7	**32,39**
RHEUMATOLOGY	0,4	0,6	1,2	1	0,4	0,6	0,5	0,7	0,6	0,4	0,2	0	**0,54**
ORTHOPEDICS	12,8	13,1	12,1	16,2	14,5	13,2	12,7	14,8	13,9	10,9	11,5	10,1	**12,91**
GENERAL EMERGENCIES	3	5,1	5,9	4,8	5,2	5,2	4,8	2,1	5,8	5,3	3,9	2,7	**4,62**
TOTAL	100	100,2	100,1	100	100,1	99,9	99,9	100,1	100,2	100,2	100,1	100	
COUNT	468	534	580	517	524	713	766	284	469	513	634	445	

STROBE checklist

	Item No	Recommendation	Page No
Title and abstract	1	(*a*) Indicate the study's design with a commonly used term in the title or the abstract	1
		(*b*) Provide in the abstract an informative and balanced summary of what was done and what was found	1
Introduction			
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	2
Objectives	3	State specific objectives, including any prespecified hypotheses	2
Methods			
Study design	4	Present key elements of study design early in the paper	3
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	3-4
Participants	6	(*a*) *Cohort study*—Give the eligibility criteria, and the sources and methods of selection of participants. Describe methods of follow-up *Case-control study*—Give the eligibility criteria, and the sources and methods of case ascertainment and control selection. Give the rationale for the choice of cases and controls *Cross-sectional study*—Give the eligibility criteria, and the sources and methods of selection of participants	4
		(*b*) *Cohort study*—For matched studies, give matching criteria and number of exposed and unexposed *Case-control study*—For matched studies, give matching criteria and the number of controls per case	
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	4-5
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	*4-5*
Bias	9	Describe any efforts to address potential sources of bias	6
Study size	10	Explain how the study size was arrived at	3
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	5

Statistical methods	12	(*a*) Describe all statistical methods, including those used to control for confounding	5
		(*b*) Describe any methods used to examine subgroups and interactions	5
		(*c*) Explain how missing data were addressed	5
		(*d*) *Cohort study*—If applicable, explain how loss to follow-up was addressed *Case-control study*—If applicable, explain how matching of cases and controls was addressed *Cross-sectional study*—If applicable, describe analytical methods taking account of sampling strategy	5
		(*e*) Describe any sensitivity analyses	5

Continued on next page

Results			
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed	6-7
		(b) Give reasons for non-participation at each stage	
		(c) Consider use of a flow diagram	6 (fig. 1)
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders	7
		(b) Indicate number of participants with missing data for each variable of interest	
		(c) *Cohort study*—Summarise follow-up time (eg, average and total amount)	
Outcome data	15*	*Cohort study*—Report numbers of outcome events or summary measures over time	*7-8*
		Case-control study—Report numbers in each exposure category, or summary measures of exposure	
		Cross-sectional study—Report numbers of outcome events or summary measures	
Main results	16	(*a*) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included	8
		(*b*) Report category boundaries when continuous variables were categorized	8
		(*c*) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	8
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses	8
Discussion			
Key results	18	Summarise key results with reference to study objectives	9
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	10
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	10
Generalisability	21	Discuss the generalisability (external validity) of the study results	11
Other information			
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which	Title page

the present article is based

*Give information separately for cases and controls in case-control studies and, if applicable, for exposed and unexposed groups in cohort and cross-sectional studies.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at http://www.plosmedicine.org/, Annals of Internal Medicine at http://www.annals.org/, and Epidemiology at http://www.epidem.com/). Information on the STROBE Initiative is available at www.strobe-statement.org.